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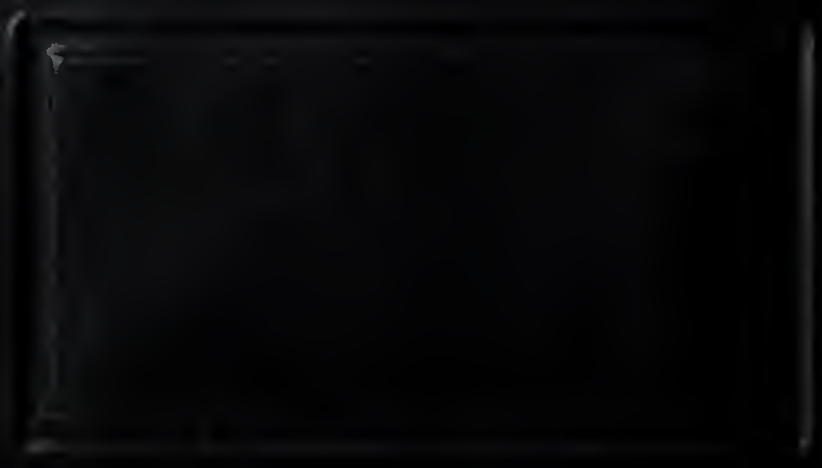
RIGIDITY AND THE PROGRAM CHANGE PROPOSAL SYSTEM

by

CAPT John C. Coffin, USMC



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By

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Bachelor of Arts

University of [illegible], [illegible]

A Thesis Submitted to the School of Government and Business Administration of The George Washington University in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

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[illegible]

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Harry Robert Page, AB, MBA

Associate Professor of Business Administration

PREFACE

This report asks the question, "Can the Department of Defense Program Change Proposal system be modified in such a way as to improve programming flexibility and responsiveness to change?" This search is directed toward improving the management situation at the military service and department level. The report is critical of the present complex, highly centralized, compliance oriented process answerable only to the Secretary of Defense. Recognizing that the "key" to flexible response on the part of service and departmental managers lies in decentralizing, to some degree, the authority that the Secretary of Defense has relegated to his hierarchical position, and recognizing that centralized authority so ingrained is unlikely ever to reverse itself, still it seems that there is only one path to follow.

In viewing the Program Change Proposal (PCP) system, we see (1) thresholds and (2) requirements for detailed costing as being the most approachable manifestations of centralized authority. Therefore, it is in these two regards that we shall expect to offer our contributions toward an improved process. The author feels quite strongly that the benefits to the system from any relinquishing of centralized authority to military service and departmental level managers will far outweigh the resulting costs.

While it is realized that a major review of the Department of Defense (DOD) management planning process is being conducted concurrently

with this report, and that the "scent of change" is in the air, the present PCP system, rather than conjecture as to future systems, necessarily commands the interest of the writer.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

The Problem of Rigidity

This paper examines the Department of Defense Planning-Programming-Budgeting System and the degree to which certain management techniques are exercised in striving for achievement of the planned objectives of that system. It is felt that there is an inherent rigidity built into the present process and that this rigidity, which perhaps was needed in earlier years to insure compliance and control, has outlived its management purpose. It is the thesis of this writer that the requirements and management techniques which contribute to system rigidity are all reflected to some extent in the published Program Change Proposal procedures, and that it is here that we should first look in seeking a means of relaxing restrictive elements. To the extent that inflexibility can be alleviated, the system can be expected to improve in its responsiveness to changing external factors and influences, as well as to better serve those who would exploit it as an effective management tool.

An Overview

In early 1961, a new planning and programming system was initiated within the Department of Defense in a move by Secretary of Defense Robert S.

McNamara to introduce and implement scientific techniques of management in defense decision making. The ultimate aim was to manage the entire defense establishment by the end objectives of missions performed. In addition, programming would provide a link by which these missions could be translated, in terms of cost, into meaningful budgets expressed in traditional budget terms and categorized in accordance with the appropriation structure. Prior to this time, no Secretary of Defense had managed to integrate strategic plans and overall defense programs with the annual budget. This was one of the underlying aims of both the 1947 National Security Act and the 1949 Amendment to the National Security Act (which further asserted the role of the Secretary of Defense in the accomplishment of this endeavor).

Traditionally, the budgets of the three military departments had been consolidated annually at DOD level and simply combined to form the proposed defense budget. Here, in conjunction with Bureau of the Budget Examiners, Defense Department representatives trimmed the budget to coincide with administrative estimates of the level of defense spending that the economy could bear. This amount represented the figure that the President would request from the Congress in support of the defense establishment. It could be expected that the President's budget request would be cut further in the House of Representatives and that, hopefully, any such cut would be restored in the Senate. In any event, the final budget figure approved would be parcelled back to the services in appropriation terms of activities or functions (such as procurement), rather than in terms of the end objectives that the

funds were meant to achieve. Since integrated defense objectives were not spelled out, the military departments were free to allocate their appropriated funds as they saw fit toward the fulfillment of their own particular plans and objectives, and toward supporting their own area and special interests. No device was available to the Secretary of Defense by which the various parallel or alternative means toward the achievement of objectives, as developed by the separate services, could be compared on the basis of cost, efficiency, or trade-off potential.

Now, under the new planning and programming process, machinery had been installed to permit the Secretary of Defense to maintain a continually updated record of all approved programs for the entire defense establishment (see Chapter IV for details of the Planning-Programming-Budgeting and Program Change Proposal processes). The system was structured so that McNamara personally had to approve all over threshold changes and any additions or deletions to the "Five-Year Force Structure and Financial Program," as the compilation of all approved programs is titled. While budget proposals would be submitted as before to the Bureau of the Budget and to the Congress for approval and appropriation, respectively, it was now the Secretary of Defense who determined "what" and "whose" programs were going to be included in the DOD budget request. Likewise, it was he who would determine, in the light of the amount of the approved budget, "what" and "whose" programs were to be cut back, discontinued, or favored.

As an aid to decision making, McNamara insisted on the employment of scientific management techniques in the form of "cost-effectiveness" studies, which are military-economic studies that compare alternative ways of accomplishing national security objectives and that try to determine the way that contributes the most for a given cost, or achieves a given objective at the least cost. (These studies are discussed in detail in Chapter III.)

Thus, we see that the Secretary, his value judgments reinforced through scientific analyses of alternative courses of action, had grasped control of the structure and strategy of the four services through the programming tool, thereby enabling him to command them and direct them toward the accomplishment of their particular shares of the overall defense mission.

Retrospect

We are now able, in retrospect, to view the performance of the new Department of Defense management process and the Five-Year Force Structure and Financial Program over the several years since its inception. The basic principles of the new system, such as centralized decision making on matters which cross service boundaries, and the use of scientific tools of management, such as cost-effectiveness studies, have become generally accepted. Indeed, many argue that we could never have achieved the broad defense capability we enjoy today without the benefit of the new system and procedures.

Many other voices have been raised, however, in discordance with the system and with the management techniques being exercised by McNamara and his staff assistants. Most criticism seems to spring from problems precipitated by the degree of centralization of management, authority, and control exercised over the services by the continually expanding and more burdensome Office of the Secretary of Defense. Another separate but definitely related problem centers on McNamara's insistence on scientific approaches to decision making, coupled with a "show me" attitude, which establishes an aura of negativism over the entire process in addition to excepting from consideration those programs which have value in light of professional military judgment but which cannot be fully documented or costed initially. (Chapters II and III will examine these particular areas of dissension more fully in order to assess the validity of criticisms. This step is necessary in order to establish the criteria for assessing the effectiveness of the present process as outlined in the following chapters.)

CHAPTER II

CENTRALIZATION OF MANAGEMENT

The exercise of authority and control within any organization can be thought of as existing on a continuum somewhere between complete centralization and complete decentralization of management. The Department of Defense position, prior to the institution of the program budgeting process by McNamara in 1961, can be considered as having existed toward the latter end of the scale.

This situation can be viewed as a carry-over of the traditional autonomous management of the services prior to establishment of the Department of Defense as a new, coordinating hierarchy under the National Security Act of 1947 and subsequent legislation. Each of the services defined national security objectives, formulated independent plans toward the accomplishment of these objectives, and provided for research, development, testing, and contracting for the procurement of weapon systems with which to fulfill its individual mission on land, sea, or air. The process lacked an overall directing force and the services often funneled funds into parallel or duplicating projects with little or no combining of efforts or exchanging of information and technology to the benefit of the public purse. This then was the situation facing McNamara upon his appointment as Secretary of Defense by President Kennedy in January, 1961. On the one side, he was faced with the

aforementioned completely decentralized and just as completely ingrown traditional management process; on the other side he was faced by legislation that removed all doubts as to the authority of the Secretary of Defense in assuming centralized management and control of the defense establishment. As the RAND Corporation's David Novick observes, "Mr. McNamara's forceful personality combined with the recognition of a legal basis for action was to result in a major movement toward integrated defense planning."[1]

Assistant Secretary of Defense (Comptroller) Charles J. Hitch recalls from this critical period:

> The new Secretary of Defense . . . made it clear from the beginning that he intended to be the kind of Secretary that /would/ . . . take the initiative in planning and direction of the defense program. Furthermore, Secretary McNamara made it known that he wanted to manage the defense effort in terms of meaningful program entities, of "outputs" like the B-52 force, the POLARIS force, the Army Air-borne Division force, etc., associating with each output all the inputs of equipment, personnel, supplies, facilities, and funds, regardless of the appropriation account in which each was financed. He wanted to know and, indeed, would have to know in order to optimize the allocation of resources, the cost of, for example, a B-52 wing--not only the cost of equipping the wing but also the cost of manning and operating it for its lifetime or at least for a reasonable period of years in the future. Only then would he be in a position to assess the cost and effectiveness of a B-52 wing as compared with other systems designed to perform the same or similar tasks.[2]

At this point we are able to observe the beginning bases in thought for what has since been viewed as a revolution in defense management. Hitch continues:

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[1] David Novick, Program Budgeting (Washington: U. S. Government Printing Office, 1964), p. 51.

[2] Charles J. Hitch, Decision Making for Defense (Berkeley and Los Angeles: University of California Press, 1965), p. 27.

> These views closely coincided with my own . . . that the financial management system of the Defense Department must serve many purposes. It must produce a budget in a form acceptable to Congress. It must account for the funds in the same manner in which they were appropriated. It must provide managers at all levels in the defense establishment the financial information they need to do their particular jobs in an effective and economical manner. It must produce the financial information required by other agencies of the government, the Bureau of the Budget, the Treasury, and the General Accounting Office.
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> But we both were convinced that the financial management system must also provide the data needed by top defense management to make the really crucial decisions, particularly on the major forces and weapon systems needed to carry out the principal missions of the defense establishment. And we were well aware that the financial management system, as it had evolved over the years, could not directly produce the required data in the form desired. It was clear that a new function, which we call programming, would have to be incorporated in the financial management system. I had hoped that I would have at least a year to smooth the way for the introduction of this new function. I recall outlining the proposed programming system to Secretary McNamara in the spring of 1961 and recommending that we spend eighteen months developing and installing it, beginning in the first year with a limited number of trial programs, with a view to expanding the system to include all programs during 1962. The Secretary approved the proposed system but shortened my timetable from eighteen months to six. Somehow we developed and installed it, Department-wide, in time to use it as a basis for the fiscal 1963 defense budget. [3]

Critics should take particular note at this time of the complexity of the task undertaken by the Secretary of Defense. Not only the pertinent bases laid in law, but the immensity of the project itself demanded more centralized decision making at Defense Department level. A move toward centralization of management must therefore be accepted as the logical approach for the Secretary to follow and criticisms must be centered then, on the "degree" of centralization of authority and control that had to be exalted to the Secretary's hierarchical position in order to support defense-wide decision making.

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[3] Ibid., p. 28.

Novick describes the new planning and programming process, as follows, shortly after its installation:

> The new process incorporates an up-to-date, five-year force structure and financial program, expressed in terms of forces, manpower, and dollar requirements. Since this program requires a continuous type of budget review, a program change control system was developed to aid in achieving this requirement. In this system, approval thresholds are established to concentrate attention on the major current or prospective issues, this being an obvious application of "management by exception." These thresholds are in terms of total obligational authority requirements, for the current or budget fiscal year and on a total basis. A progress reporting procedure for about 200 of the most important material items is employed. Milestone schedules are established to reflect the events and activities upon which the financial plan is based. Actual accomplishment is reviewed monthly against the milestones and remedial action is taken or revisions are made to the five-year plan as necessary.[4]

While requirements for dollar costing of future force and manpower levels, along with continuous budget review, as described by Novick, were sure to prove a burden to the services, it is felt, from the standpoint of centralization of authority and control, that the establishment of thresholds and reporting procedures offers us the best criteria for assessing the degree to which such centralization of the management function is carried out. Thresholds establish ceilings on the exercise of decision making, authority, and control by managers at lower levels in the hierarchy. Reporting procedures point up performance variances, deviations from established schedules or budgets, and non-compliance with established procedures and directives. Both thresholds and reporting requirements can be recognized as being

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[4]David Novick, Program Budgeting: Long-Range Planning in the Department of Defense (Santa Monica, Calif.: The RAND Corporation, November, 1962), p. v.

restrictive elements within the system, in that they confine the performance of lower managers to within certain specified limits. The degree of flexibility within the system can be assumed to vary in a direct relationship to the level at which subordinate authority thresholds are established, and to vary inversely with the stringency of performance standards and reporting requirements. System difficulties in both of these areas will tend to be manifested in the form of human problems.

This contention is reinforced by Roland N. McKean and Melvin Anshen, who, in assessing problems, risks, and limitations of program budgeting as they might be reflected in a theoretical agency, OSR (which looks far more like an after-the-fact review of the Department of Defense process), warn of too centralized authority and of certain long-run costs that must be weighed against the benefits of such centralization.[5] In summarizing their views, it is noted that low thresholds result in more and more decision making moving to the top. Lower-level managers thus find that they have no bargaining power, that their views have no impact at higher levels, and that they lack authority to initiate studies or pilot projects that might substantiate their views. In such cases, incentives to invent and urge alternatives are weakened; it becomes less rewarding to innovate; and with greater pressures for compliance alone, lower-level groups become biased toward "safe" proposals and refrain from rocking the boat.

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[5]Roland N. McKean and Melvin Anshen, Program Budgeting, ed. David Novick (Washington: U. S. Government Printing Office, 1964), pp. 223-232.

On the other hand, these same low thresholds result in more decision making at the top level. McKean and Anshen point out that as loss of incentives and motivation or efforts to fight the system affect the contributions of lower level managers even more adversely, the central group finds more and more of the burden falling at its doorstep. Studies tend to become increasingly centralized, resulting in harsh screening from a particular point of view. Analyses tend to become "design studies" of one "required system" as analysts and reviewers perceive that their superiors frown on certain alternatives which therefore are not considered.

As the central group makes more and more of the decisions and records them in an official plan, McKean and Anshen contend that they understandably tend to defend these decisions and resist changes. A natural desire to keep lower level agencies from constantly reopening issues may convert what ought to b` sequences of decisions into "one-shot" decisions which, over the long run, might aggregate the tendency to pick "best" prematurely and to become unnecessarily committed to a course of action.

Another consequence of excessive central control of programs is the neglect of uncertainty resulting from consideration of the judgments of one group as opposed to the diverse judgments of several branches or agencies. Uncertainties tend to be further neglected as the magnitude of the task of central control makes it essential to simplify decision making, since the natural way to simplify a decision is to disregard uncertainties. Lower level groups tend to become biased toward "safe" proposals because the cost of hedging

against uncertainty is hard to justify to a cost-conscious central group.[6]

Lester Bittel, in his recent book, Management by Exception, sheds further light on our subject. In case studies involving the introduction into functioning organizations of well laid, systematic, logical plans (an apt description of the program budgeting process), he traces subsequent failures to the inability of management to deal with human variables. Results disclosed that top management's expressed requirements for full reports, rigid controls, exhaustive financial analysis, and, in one case, for itemizing of expense accounts brought reactions on the part of lower level managers, exemplified by feelings of threat to security or to the exercise of prerogatives, feelings of conflict due to sudden change and, in the last case, feelings of an implied insult to individual integrity. Bittel goes on to tie such factors in with management at the Pentagon:

> In a 1963 editorial Life magazine was critical of what it called "McNamara's Human Problem." Although the editorial acknowledged that "In most respects, McNamara is the best Secretary of Defense the U. S. has had," it deplored his coldly analytical efficiency, which in Life's view destroys the support of military leaders "to whom strategy and tactics are arts, not sciences, and who need operating flexibility as well as the clear management line imposed by the Secretary." Life concluded, "We need not choose between efficiency and leadership; the nation needs both. It also wants the civilian Secretary to have the last word. But he has evidently been having it in too abrupt, rigid, and even contemptuous fashion. In short, he has a management problem of the most important kind, human management. When he surmounts that one, he will be a great Defense Secretary."
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> Mr. McNamara, as are indeed most executives, was not aware of the human problem. His difficulty was in solving it. He, like the rest, was trying to establish and hold that delicate balance between decisive,

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[6] Ibid.

> logical action on the one hand and intelligent permissiveness on the other. For without the latter, experience tells most managers, they will not gain the support and cooperation needed to move an organization forward in unity.[7]

While there remains too much contrary evidence for us to accept Bittel's implication that McNamara has solved his "human problem," he does point the way for our later approach to the question of centralization of authority and control as opposed to system flexibility and responsiveness to changing conditions. We can see that many criticisms of the system arise out of conflict between the motivations of individual lower level managers and the degree to which the basic structuring of the system inhibits or thwarts them as they seek the fulfillment of their individual needs, such as security, status, achievement, participation, and self-fulfillment. One of the lessons we should learn here is that many criticisms are likely to be but superficial indications of more deeply rooted structural deficiencies which are not necessarily apparent, nor will they be easily identified in degree. In such a case, it would seem appropriate to assume, to the extent that we can isolate and identify the problem, that a little less, or a little more, of the critical factor, as the case may be, will benefit the system (we hope, through closer alignment of individual and organizational goals). In other words, we are unlikely to find a case in which the problem is so obvious, and the decision so clear-cut, that we are able to arrive at an optimal solution; but we are more likely

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[7] Lester R. Bittel, Management by Exception (New York and San Francisco: McGraw-Hill, Inc., 1964), pp. 262-264.

to face a situation where recommendation of a more favorable "range" of activity or "degree" of compliance seems desirable.

CHAPTER III

SCIENTIFIC METHOD

Criticism

We are drawn to an examination of the Secretary's scientific management methods by the vast amount of criticism that their use has engendered. These decision-making procedures are generally summarized in the term "systems analysis," which includes the controversial and closely related "cost-effectiveness," "cost-benefit," and "cost-utility" analyses.

A basic premise of the entire concept of systems analysis as a tool for defense decision making is that military decisions are economic decisions. This recognizes that our wants are limited by the scarcity of resources (dollars, manpower, materials), otherwise we could have all of everything we wanted and there would be no need to exercise choice. Since we are limited by resource constraints, and since we are faced with problems of choice, we must be guided in our decision making by consideration of the opportunity costs of that which we must forego, in order to have something else. If we are the Secretary of Defense, this means that every dollar spent toward the accomplishment of a particular mission, or achievement of a particular capability, is one dollar less to be spent toward the accomplishment of other just-as-necessary missions, or toward the achievement of other just-as-necessary capabilities.

The "systems analysis" tool permits the consideration of possible alternatives and potential trade-offs among them over a wide range, and eliminates from consideration those alternatives that do not fit the established criteria. In this manner, the decision maker is able to concentrate his energies on the few really relevant alternatives in arriving at a more thoroughgoing decision.

While such a system would seem to lead to much more efficient decision making, the cries of critics would suggest that perhaps there are weak points to the process, along with the benefits to be derived. One such critic, Hanson Baldwin, who has referred to McNamara as the "apostle of cost-effectiveness," seems to have summarized a goodly number of the most often heard criticisms when he charges:

> Mr. McNamara's "whiz-kids" complete with sliderules and computers brushed aside the factor of professional judgment or scientific hunch when they took office and their emphasis on "perfection on paper" and the "cost" part of the "cost-effectiveness" formula has definitely slowed the pace of military development. [1]

Daniel Seligman's findings tend to support Baldwin's criticisms. He reports:

> Systems analysis is an endless source of exasperation to many military men and Congressmen, because it often leads the Pentagon to resist intuitive judgments whose truth seems perfectly obvious. [2]

Seligman notes also the widely held view that "cost-effectiveness" studies are,

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[1] Hanson W. Baldwin, "Slow-Down at the Pentagon," Foreign Affairs, Vol. 43, Nos. 1-4 (October 1964 to July 1965), p. 263.

[2] Daniel Seligman, "McNamara's Management Revolution," Fortune, Vol. LXXII, No. 1 (July, 1965), p. 246.

in effect, "elaborate rationalizations for not buying things we need, or for buying second-rate weapons systems, for endangering our men's lives in an effort to save money."[3]

Hitch too reports that:

> The suspicion still persists in some influential quarters that . . . cost-effectiveness studies put "dollars before national security" or will result in going to war with "cut-rate, cut-quality, cheapest-to-buy weapons."[4]

As we examine the above arguments, we begin to detect again the pattern observed in our discussion of centralization of management, which seemed to indicate that many criticisms tend to be superficial reflections of some deeper antagonism. We can perceive that elevating decision making to a hierarchical level above the services tends to "brush aside the factor of professional judgment." Also, we can perceive that in placing cost-effectiveness studies at this same hierarchical level under the guidance of young, mathematically grounded analysts ("whiz-kids") aided by computers, whose purpose is to cost out alternative courses of action, the experienced military judgment of lower level managers will have even less influence on the outcome. The demand for perfection on paper (a reference to the project definition phase of development) would seem to set aside the "scientific hunch" (ideas or proposals having no present military requirement, but which would provide a hedge against uncertainty in that they would negate the threat of

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[3] Ibid.

[4] Hitch, Decision Making for Defense, p. 43.

enemy weapons developed to counter our present weapnn systems and capabilities), in that specific operating requirements and the cost effectiveness of the system must be confirmed and goals, milestones, and time schedules established before full development is initiated. The argument that cost-effectiveness studies put dollars before security is apt to come about when the initiator of a proposal sees performance trimmed from his weapons system in order to cut costs.

While we can agree that there may be some validity, then, to these arguments, two points seem to manifest themselves through our observations. First, there seems to be a lack of understanding of the fact that systems analysis is a "total system" concept and that, as such, it does not lend its results to interpretation by lower level managers in the same light as they would view the problem at their level. This leads into the second point, which is that critics, perhaps perplexed at facing the vagaries of a process dealing with advanced mathematics, computers, and uncertainties, seem to vent their wrath not on the underlying causal factors inherent in the systems analysis process, but rather on the effects of the methodology as they are perceived to be reflected in the value judgments of the decision maker.

In response to the first of these points, it should be noted that the Secretary in his decision-making role is concerned with the same "total system" as is the systems analyst. Lower level managers, on the other hand, are "sub-system" managers in the total system concept and, as such, are rightly concerned with the particular aspects of management and decision

making applicable to these levels. Because the criteria by which alternatives are selected differ between system and sub-system levels within the total system, the lower level manager is apt to fall victim to viewing the top-level decision in the light of sub-system criteria. Perhaps herein lies the source of many of the rationalized grievances put forth in criticism of systems analysis as a tool of the decision maker. Perhaps this helps to explain why lower level managers find their toes stepped on occasionally and their judgments unheeded (or unwanted), as a logical outgrowth of propounding military judgments based on other than the criteria established for the top-level decision. The initiator of an airborne weapons system proposal, for example, is rightfully concerned when he finds performance cut for the sake of cost. The Secretary, on the other hand, is concerned with the "big picture"; he may see the opportunity cost of an additional 10 mph of airborne weapons system capability as being a trade-off against having another fully equipped battle group or another guided-missile frigate within the total defense arsenal.

The second point we mentioned was that critics seem prone to overlook the causal factors inherent in systems analysis and tend to direct their criticisms instead at the effects or end results of the studies, as they come to bear at the point of decision. In order that we too do not find ourselves in this position, we shall review the systems analysis methodology in order to detect areas in which the process is subject to error. Through this procedure we should be better equipped to critically examine the role of systems analysis as a function of the Department of Defense decision-making process.

E. S. Quade perhaps offers our best starting point by breaking systems analysis down into five essential elements:

> 1. The objective (or objectives). Systems analysis is undertaken primarily to suggest or, at the very least, to help choose a course of action. This action must have an aim or objective. Policies or strategies, forces or equipment are examined, compared, and preferred on the basis of how well and how cheaply they can accomplish the aim or objective.
> 2. The alternatives. The alternatives are the means by which it is hoped the objectives can be attained. They need not be obvious substitutes or perform the same specific function.
> 3. The costs. Each alternative means of accomplishing the objectives implies the use of specific resources which cannot then be used for other purposes.
> 4. A model (or models). The model is a representation of the situation under study designed to predict the cost and performance of each alternative. It abstracts the relevant features of the situation by means which may vary from a set of mathematical equations or a computer program to an idealized description of the situation in which judgment alone is used to assess the consequences of various choices.
> 5. A criterion. A criterion is a rule or test by which one alternative can be chosen in preference to another. It provides a means for using cost and effectiveness to order the alternatives.[5]

The Objective

The first and key step of a systems analysis is definition of the problem; stating the problem limits to be explored; spelling out the meaningful facts that bear on the problem; recognizing the constraints that limit the objective; and describing the bounds within which it must be achieved. To the extent that the problem contains non-quantifiable factors, such as problems of long range, problems whose solution depends on hardware not yet

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[5]E. S. Quade, Analysis for Military Decisions (Santa Monica, Calif.: The RAND Corporation, 1964), p. 155.

developed, or that hypothesize the integration of systems not yet in existence, the analyst must postulate relative values rather than absolute values in order to solve the problem. In such a case, the solution will be sought within a range of value described by the maxima and minima that have been examined. Of greatest importance here is that the problem is structured so that the right questions are being asked. The experience, skill, imagination, and intuition of the analyst plays a key role in starting the analysis off in the right direction.

Alternatives

Alternative, by definition, implies an opportunity to choose from among more than one possible option. Each alternative posed must be an acceptable potential solution to the stated problem, and it is assumed that all alternatives are comparable, or, if not, that their differences are recognized. Alternatives are generally differentiated from one another either by function or by degree of performance. The selection of alternatives for evaluation must take into consideration the resource constraints to the problem, such as funds, personnel, equipment, and facilities restrictions. Should the analyst find that none of the alternatives examined provides a satisfactory solution to the problem, he should invent new alternatives. On the other hand, if the possible alternatives prove too numerous to examine individually, many may have to be eliminated by assumption.

Assumptions

An assumption is a means used by the analyst to deal with difficult realities or qualitative factors that tend to upset the problem-solving routine. The assumption infers the existence of a fact, not known with certainty, from the known existence of other facts. Because they are not demonstrable, assumptions tend to become weak points in the analysis; but to the extent that they do not change the level of uncertainty, or alter the cost-effectiveness relationship of an alternative, they are useful, essential parts of a problem. The important thing to bear in mind here is that the conclusions of the analyst will always be directly relative to the validity of the assumptions on which he bases his analysis.

The assumptions made in systems analysis have been a source of complaint by experienced military observers who, on occasion, have been able to disprove an assumption, and therefore disprove an unfavorable conclusion of the analysis. Quade notes that "the comparative frequency of such complaints, which are, sad to say, sometimes quite well founded, is a tribute to the relative explicitness of the assumptions and reasoning in a systems study."[6] Our view of such complaints might properly take an opposite approach from that of Quade. We would note that to the extent that the analyst fails to document explicitly his assumptions and supporting reasoning, he denies practiced military observers the opportunity and the right to criticize the analysis. In such a case, the military critic, finding his cause to be on the wrong side of the

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[6] Ibid., p. 105.

conclusions of the analysis, is faced with a virtually impossible task of reconstructing the analysis in an attempt to detect the application of invalid assumptions, or he must forego the exercise of the right of reclama (or both). The real impact is likely to be felt in the national defense posture, to the extent that worthy alternative weapons systems or capabilities have been foreclosed from consideration by failure of the analyst to document his assumptions.

Costs

Perhaps the importance of treating costs as a major element of the systems analysis methodology is best emphasized by Hitch in the statement:

> Furthermore, there has been a tendency in the Defense Department to state military requirements in absolute terms without reference to their costs. But the military effectiveness or military worth of any given weapon system cannot logically be considered in isolation. It must be considered in relation to its cost, and in a world in which resources are limited, to the alternative uses to which resources can be put. Military requirements are meaningful only in terms of benefits to be gained in relation to their cost. Thus, resource costs and military worth have to be scrutinized together.[7]

While we might be inclined to think of costs in terms of budget dollars alone, we find that systems analysis views them in a much broader perspective, as they interact within the system to add to or detract from the attractiveness of alternative courses of action. Stanford L. Optner, in describing

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[7] Charles J. Hitch, Assistant Secretary of Defense (Comptroller). Testimony in Systems Development and Management (part 2), Hearings before a Subcommittee of the Committee on Government Operations, House of Representatives, 87th Cong., 2d Sess. (Washington: U. S. Government Printing Office, 1962), p. 515.

the nature of systems, points out that:

> Costs are dimensionally described by dollars, man-hours, pounds, or other quantitative yardsticks of kind. Costs may also be described as a period of time . . . (or) may be expressed by assigning values to qualitative expressions of effectiveness.[8]

Costs then, as viewed in this much broader context, may enter a systems analysis in many ways. They may be related to availability of resources, to the urgency of the achievement of an objective in terms of time, or to the degree of effectiveness to be achieved.

Complexity enters the systems analysis even further, with the introduction of these three measures of cost, time, and effectiveness. Since the analyst is able to maximize or minimize only one of these measures at a time, he is limited at best to optimizing the remaining measures. For example, the analyst, faced with minimizing cost, would be able only to optimize time and effectiveness in the face of the cost constraint. On the other hand, to maximize effectiveness, he would be unable to minimize costs and time, because they are the price he must pay in order to maximize effectiveness. Likewise, we can see that minimizing time is likely to drive costs up and effectiveness down, so that the analyst can only hope to "optimize," or gain the "best" result in relation to the given time allowed.

Another factor which enters and complicates the systems analysis is the matter of accuracy of cost estimation and the part it plays in reaching a solution to the problem. We can see that the analyst must carefully weigh

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[8]Stanford L. Optner, Systems Analysis for Business and Industrial Problem Solving, ed. W. Grant Ireson (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965), p. 33.

[illegible]

[illegible]

[illegible]

cost, time, and effectiveness trade-offs in selecting or eliminating alternatives from consideration as potential solutions to the analysis. But if cost estimates of a certain alternative were underestimated by 1000 per cent, would not that tend to bias the analysis in favor of this alternative, perhaps to the exclusion of others? We believe that it would, and we point to this factor as a weakness of the analysis, of which the decision maker must be aware. That such error in cost estimation is a not-too-uncommon occurrence is pointed out by W. H. Meckling, who relates:

> . . . sometimes we (conveniently) forget how far our predictions have missed the mark in the past. For example, we have found that estimates of cost of production are seldom within a factor of 2 (200%) of actual costs, and not uncommonly are off by factors of from 5 to 10. Similarly, slippages in time to operational status of from 2 to 5 years are not unusual. Performance parameters are generally more accurate, but even here differences of 25 per cent from original estimates are not uncommon.[9]

While admittedly courses of action must be assessed, and decisions made, on the basis of the best cost estimates available, it would seem that herein lies an easily disregarded weakness of the systems analysis. The multiplicative effect of mathematical methods used to differentiate between alternatives is likely to further amplify costing inaccuracies as they come to bear on the decision. Perhaps a solution here would be to compare alternatives over a range of costs (based on the error rate and our best cost estimates), and to base our decision on some other factor than cost, in those

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[9] W. H. Meckling, Analysis for Military Decisions, ed. E. S. Quade (Santa Monica, Calif.: The RAND Corporation, 1964), p. 228.

cases where both the acceptance and elimination of the alternative as a potential solution fall within this particular range.

Models

The role of the model in systems analysis is that it is a manipulatable representation of the real-life system under investigation. The model is built on a set of assumptions which allow us to simplify it in such a way as to highlight those factors which are relevant to the problem and to suppress those that are relatively unimportant. Usually the model is in the form of an equation or set of equations which express an identified relationship that exists among a set of relevant variables. By holding constant one variable at a time and manipulating another, it is possible to view the interaction of the separate variables over a wide range of system activity. Thus, through use of the model, alternatives may be examined over a range of activity not readily observable in real life, then arrayed for the decision maker over a range that would cover all likely contingency situations.

The model can be an extremely useful tool, properly constructed and directed toward answering the questions that the analysis is attempting to answer. There are, however, several factors of model construction that bear watching: qualitative factors, assumptions, and the aggregating or lumping of diverse items. Since the model is able to represent only quantifiable factors, qualitative factors may properly be set aside; but they must be set aside explicitly for later consideration of their effects along with the output of the

model. We have already discussed assumptions as a tool for simplifying hard-to-handle factors of reality that tend to complicate the analysis. We should remember that assumptions also must be explicitly set forth in the analysis in order that any factors eliminated from consideration, which should later prove relevant to the study, are apparent to the decision maker. The third factor, aggregating, refers to the lumping together, for example, of such diverse factors as pay and allowances, travel costs, and training costs under personnel costs, in order to simplify the model. It would seem that such aggregating, too, must be explicitly set forth in the analysis, in that while aggregated values may vary relatively little over a broad range of alternative comparisons, they are likely to have highly divergent and easily overlooked effects if the model is operated at extremes of its useful range. Properly documented, such factors are open to observation and criticism, and thus support the validity of the model.

A Criterion

A criterion was earlier described as a rule or test by which one alternative can be chosen in preference to another and as providing a means for using cost and effectiveness to order the alternatives. In addition, it is a device through which the analyst is able to show consistency in his exercise of preferredness in choosing among alternatives.

It is important for us to understand that both the objective and the constraint are employed in designing the criterion which is first conceived in terms of the objective, and then conditioned by the constraints. For example,

our objective might be to achieve a certain amount of damage against an enemy installation. Having determined this objective, we would then seek to establish the least cost means of achieving this ability, cost being the conditioning constraint.

The choice of criterion may be complicated by the fact that quantitative measures may at times have to give way to qualitative measures of preferredness. While the fine measurability of quantifiable criterion is lost, the analyst is still able to order alternatives in the qualitative sense of best to worst, or high to low.

Generally, the analyst will attempt to treat large complex problems with broad criteria; however, at times he is forced to break the large problem down into component sub-problems. In such a case, he must devise appropriate, narrow criteria with which to treat these sub-problems, mindful of the fact that what seem to be plausible tests of lower level choices may easily be inconsistent with higher level choices.

In summary, we must insure that the analyst is consistent in his exercise of preferredness, that the stated criterion is structured in terms of the objective, as conditioned by the constraints of the problem, that the criterion provides a means of measuring the relative worth or effectiveness of alternatives, and that sub-problem criteria are consistent with higher level criteria. To the extent that criteria fall short of meeting these tests, McKean suggests that we can subject alternatives to more than one test and "look for dominance"; that we can allow for shortcomings of the criterion when

"interpreting the analysis, drawing conclusions, and drafting recommendations"; or finally, that we can give up the use of any neat criterion and "simply spell out, for sensible alternatives, certain relevant consequences called costs and others called the achievement of objectives," and array them before the decision maker for his judgment.[10]

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[10]R. N. McKean, Analysis for Military Decisions, ed. E. S. Quade (Santa Monica, Calif.: The RAND Corporation, 1964), p. 90.

CHAPTER IV

TODAY'S PERSPECTIVE

In Chapter I, we alluded to an inherent rigidity having been built into the Department of Defense management process. It is the thesis of this writer that an approach to relaxing such system rigidity lies in slackening the stringencies of management techniques and requirements as effected through Program Change Proposal procedures. With this view, we shall examine in this Chapter the present planning, programming, budgeting, and program change processes as set forth in applicable Department of Defense and service directives, with the aim of highlighting those management techniques and requirements that would seem to bear on our problem.[1]

Planning

Planning plays a decisive role in focusing attention on future goals, objectives, and capabilities. In addition, planning imparts direction to the expenditure of effort and resources toward the achievement of these objectives and capabilities. Long-range plans of the services, as characterized by those

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[1]Discussion which follows is drawn from DOD Directive 7045.1, "DOD Programming System," October 30, 1964; DOD Instruction 7045.2, "DOD Programming System; Procedures for Program Changes, January 29, 1965; DOD Instruction 7045.5, "DOD Programming System; Functional Program Reviews," August 31, 1965; and HQO p 3121.2, "Marine Corps Manual for Planning and Programming."

of the Navy and Marine Corps, typically look ten to twenty years into the future. Here they are concerned with appraisal of the strategic situation, concepts of operation, capabilities, force structures, and other requirements which reflect analysis of the threat perceived to be possible in the time period considered, in light of basic national security policy. These long-range plans are time phased into the period ranging from two to ten years in the future in the form of mid-range objectives plans which take into consideration and reflect guidance of the Joint Chiefs of Staff, decisions of the Secretary of Defense on forces, resources, and capabilities, results of special studies, and recommendations of force commanders in the field.

In addition to these unilaterally developed plans, the services participate in Joint Chiefs of Staff (JCS) and other joint planning (as in the case of service participation in one of the unified and specified commands, or in the case of joint operation such as experienced by the Marine Corps and the Navy, under the Secretary of the Navy). Through the participating service member of the JCS, the service's views, comments, and recommendations, plus any information or guidance on forces, are submitted for inclusion in JCS plans during preparation, review, and revision, or for JCS consideration in the case of service participation reflected in JCS reviewed plans of commanders of the unified and specified commands. Thus, in addition to receiving JCS guidance in the formulation of unilaterally developed plans, the services in turn feed back their own recommendations and comments for consideration in the annual JCS review and updating of the Joint Strategic Objectives

Plan (JSOP).

Upon completion of the annual Joint Chiefs of Staff review of the Joint Strategic Objectives Plan, it is sent to the Office of the Secretary of Defense, where it is reviewed, and becomes the basis for the issuance of Tentative Force Guidance (TFG). Such tentative guidance is issued by the Secretary of Defense to the secretaries of the military departments, the Department of Defense agencies, and the Joint Chiefs of Staff to the extent that the decisions affect them. TFG is tentative only in the sense that it is subject to reclama (appeal) by an addressee, and it applies primarily to major force levels to be included in the next budget. Upon receipt of comments or reclamas, the Secretary of Defense either confirms or modifies his original decision, this final decision becoming the basis for preparation and submission of Program Change Proposals (PCP's), approval of which constitutes approval of the resources required to support the particular force change.

Programming

Programming is the management tool by which plans are translated into capabilities. It involves determination of quantity and timing of resource requirements and emphasizes the realities of cost, feasibility, and effectiveness. Programming examines and identifies alternative courses of action to achieve approved objectives. It provides an integrating link between the functions of military planning and budgeting.

To the extent that military plans are approved by the Secretary of Defense, they become time phased into the Five-Year Force Structure and

Financial Program (FYFS&FP), which contains all approved programs within the Department of Defense in terms of missions or national objectives. The FYFS&FP projects not only military plans, but the associated resource impact of the approved forces for eight fiscal years into the future, and projects the remainder of the program (i. e., manpower, equipment, supplies, and installations required to support them) for five fiscal years into the future. In addition,the program projects the full costs of these resources, thus allowing the decision maker to view, over time, any particular program or element thereof in the light of full cost implications and financial feasibility, and providing therein a sound basis for the development of annual budget requests to the Congress.

The Five-Year Force Structure and Financial Program, which represents the entire Defense effort, is organized into eight major military programs. These are:

I	Strategic Retaliatory Forces
II	Continental Air and Missile Defense Forces (including Civil Defense)
III	General Purpose Forces
IV	Airlift and Sealift
V	Reserve and Guard Forces
VI	Research and Development
VII	General Support
VIII	Military Assistance.

Each major program is composed of a combination of time-phased program elements assembled toward accomplishment of a definite plan or objective as outlined by the particular program. These program elements, of which there are over 1, 100 presently identified and new elements being added, are the basic building blocks of the FYFS&FP. Program elements form the interface between defense programs and budgets in that they may be aggregated into meaningful measures of functional performance of missions, on the one hand, and into traditional appropriation categories of budgets, on the other. Program element dollars constitute the common denominator which permits the transfiguration of missions into budgets and budgets into missions at this point of interface.

The FYFS&FP is maintained through a series of program reviews, program changes, and cost reporting procedures. Defense components are responsible for maintaining a continuous surveillance and review of their programs and for submitting change proposals promptly whenever there is need for revisions which meet or exceed threshold limitations. In addition, the programming system provides for annual comprehensive reviews which are designed to provide background for early change decisions to the FYFS&FP, which will form the basis for the next budget submission. Other reviews include requirements studies directed by the Secretary of Defense, proposed force changes resulting from JCS review of the Joint Strategic Objectives Plan, and functional area reviews of interrelated program elements or aggregations, such as intelligence or communications.

In order to reflect the latest and best information on prices and costs, cost reporting procedures require that repricing changes which meet or exceed program element or item thresholds be submitted for review and approval through program change proposals as soon as identified.

The FYFS&FP is advanced annually by one year in accordance with a schedule which allows the new year forces, manpower, costs, and support items to be considered in the context of the comprehensive program reviews.

Budgeting

Following annual review and updating of the Five-Year Force Structure and Financial Program, the Secretary's budgeting task revolves around detaching the next succeeding fiscal slice from the approved program, reconstructing it into conventional budget categories, and submitting it to higher levels for review and approval.

Annually, in October, the budget becomes the subject of joint review at the Bureau of the Budget by Department of Defense and Budget Bureau officials. Here a budget ceiling is established on defense spending in order to keep it in line with the President's estimate of the amount of defense spending the economy can bear. Since the magnitude of dollar resources that can be allocated to defense spending in any one year is usually less than the total of programs approved in the FYFS&FP, certain programs may have to be reduced or deleted when the budget is modified. The Secretary of Defense makes decisions regarding those programs he feels will have to be cut, and he transmits this information to the services. This is accomplished through

the Subject/Issue (S/I) process, more popularly known as "Operation Snowflake." The Secretary may issue several hundred such subject/issue papers during the process of budget formulation. To the extent that the services feel that restoration of such cuts is essential to effective performance of the mission assigned, they are permitted to request reconsideration by means of reclama.

The defense budget, as approved by the President through the Bureau of the Budget, becomes a part of the President's government-wide financial plan for the following fiscal year. This approved defense plan serves as the basis for a major updating of the FYFS&FP in December or January, in order to bring the program into complete agreement with the budget submitted by the President to the Congress. This major updating serves as a base for subsequent monthly updating to reflect all decisions and changes made during the month, including any replanning or reprogramming actions resulting from Congressional review of the budget.

Passage by Congress of all authorization and appropriation bills is usually complete by late summer. The individual services request apportionment of their particular approved funds by the Bureau of the Budget, as each supporting appropriations bill is passed. Such funds as are apportioned are subject to release to the requesting services by the Assistant Secretary of Defense (Comptroller), as approved for program execution, thus completing the budgeting cycle.

Program Change Procedures

The Five-Year Force Structure and Financial Program is designed to give the Secretary of Defense control over the programs of all components of the Department of Defense. A Program Change Control System provides the machinery by which this control device is updated and, in addition, assures that cost and performance variances, as well as shifting force and resource requirements, are brought to the attention of the Secretary of Defense for decision making. The Secretary's function in updating the FYFS&FP is facilitated by Program Change Proposal (PCP) procedures which offer a methodical and systematic approach to decision making in terms of missions, capabilities, and costs.

Basic to the Program Change Control System is the establishment of formal decision-making thresholds. Implementing DOD components are required to submit for prior Secretary of Defense approval, any decisions which singly or in the aggregate exceed these thresholds. Other program change proposal requirements result from Secretary of Defense decisions handed down, which must be answered by formal PCP submission.

Current thresholds are exhibited in the Figure on the succeeding page. Threshold-related PCP's may originate in response to any of the following requirements:

1. The DOD components are responsible for maintaining a continuous surveillance and review of their programs, and for submitting change proposals promptly whenever there is a need for revisions which meet or exceed threshold limitations. The responsibility for submitting changes is not limited to the implementing organizations, but all DOD

Category	First Program Year	Total Program Cost/Quantity
1. TOTAL OBLIGATIONAL AUTHORITY		
a. DOD Component Total	Any increase	Any increase in any fiscal year
b. Research and Development		
(1) New program elements in Program VI (R&D)	Any	Any
(2) Changes to program elements in Program VI	$10 million	$25 million
(3) Changes to R&D category in program elements of other programs	$10 million	$25 million
c. Investment		
(1) Approval for procurement and deployment of items under development	$10 million	$25 million for total force requirements
(2) New items or projects to be added to:		
- Material Annex	$10 million	$25 million
- Construction Annex	$ 5 million	$ 5 million
(3) Changes to:		
- Program elements	$10 million	$25 million
- Materiel items	$10 million	$25 million
- Construction projects	$ 5 million	$ 5 million
d. Operating Costs - Program elements	$20 million	$50 million
e. Military Assistance Program - New Country/Non-Country	Any	Any
2. MANPOWER		
Changes in total military or civilian	Any increase	Any increase
3. FORCES		
Changes in latest approved FYFS&FP	Any	

Fig. --Thresholds

components are encouraged to submit program changes for any area of interest or concern to them.

2. To reflect the latest and best information in the FYFS&FP on prices and costs, repricing changes which meet or exceed program element or item thresholds will be submitted for review and approval through program change proposals as soon as identified.

3. Above-threshold changes to the FYFS&FP will be processed through program change proposal procedures. Such PCP's will reflect relevant changes applicable to prior, current, budget, and all program years.

4. Changes in the program from the latest approved FYFS&FP which are below prescribed thresholds and are not subject to approval requirements of existing directives or instructions may be approved on the authority of the heads of the DOD components, provided that the aggregate of such departmental or DOD component changes are less than the applicable threshold. When the aggregate of these changes, together with the additional changes proposed, equals or exceeds a threshold, a program change proposal will be submitted.

5. While Total Obligational Authority (TOA) changes to the FYFS&FP which affect only those years prior to the first program year are submitted under reprogramming procedures, those program change proposals which meet or exceed applicable TOA thresholds in program years and also affect prior years require submission of a PCP and a reprogramming action following the Secretary's decision on the PCP. (During the first six months of the current fiscal year, the first program year is the budget year. During the last six months of the current fiscal year, the first program year is the budget year plus one).

Non-threshold related Program Change Proposal submissions may be required as a result of Annual Comprehensive Program Reviews. These reviews provide the background for early decisions on changes to the FYFS&FP which will form the basis for the next budget submission. The reviews will include but will not be limited to:

1. Requirements studies directed by the Secretary of Defense.

2. Proposed force changes by the Joint Chiefs of Staff (e.g., JSOP).

3. Functional area reviews of interrelated program elements or aggregations, such as intelligence, communications, etc.

Results of studies and functional area reviews are submitted to the Secretary of Defense for evaluation on an "as occurring" basis. Comprehensive proposals for force changes are submitted annually in the case of Joint Chiefs of Staff reviews, for evaluation by the Secretary of Defense. Following such evaluation and subsequent issuance of guidance on proposed force changes program change proposals must be submitted by the implementing DOD component for approval of the specific TOA and manpower required to support the force changes.

Servicing the PCP

Department of Defense instructions provide that Program Change Proposals will be self-contained and include all back-up information and data and particularly factors utilized in any resource computations which are appropriate to the proposal under consideration, in order to facilitate staff review and evaluation. PCP's must be signed and transmitted by the head of the submitting DOD component to the Secretary of Defense, whose office routes all copies to the Assistant Secretary of Defense (Comptroller) for processing. If the PCP is submitted by other than the implementing DOD component and requires additional data for completion, the ASD (Comptroller) may forward the PCP to the implementing DOD component for completion of the data not initially furnished.

The ASD (Comptroller) reviews each PCP for clarity and sufficiency of data, then designates an Office of the Secretary of Defense (OSD) component having predominant interest in the subject of the PCP as the Primary Action Office (PMO). Other DOD components having relevant responsibilities or interests are designated as Participating review offices. The ASD (Comptroller) in collaboration with the primary action office establishes suspense dates for review action by all review components. Copies of the PCP are forwarded to each designated review office as well as the Joint Chiefs of Staff.

All participating review components submit their evaluations and recommendations (Format A) to the primary action office except that the Joint Chiefs of Staff may submit their recommendations directly to the Secretary of Defense with a copy to the PMO. Emphasis is placed on a team effort coordinated by the primary action office. The PMO prepares a consolidated evaluation and recommendation (Format A) for submission to the Secretary of Defense and a proposed decision (Format B) for signature by the Secretary.

Upon signature by the Secretary of Defense, the Format B is forwarded to ASD (Comptroller) for recording and transmittal to the submitting and implementing DOD component(s). Copies of the decision are transmitted to the previously designated review components, including the Joint Chiefs of Staff. The head of the implementing DOD component acknowledges receipt of the Secretary's decision by signing a copy of the approved Format B and forwarding it to ASD (Comptroller) within five working days of receipt. Should

the head of the implementing DOD component believe that the Secretary of Defense should reconsider his decision, he may submit a reclama within ten working days of receipt of the decision, provided that such a reclama emphasizes new or additional data not previously submitted.

Provision is also made for Simplified Program Change Proposals (SPCP) which are proposals to record changes to the approved program reflecting decisions already made by the Secretary of Defense or corrections or adjustments which are not in conflict with the approved program. SPCP's may be signed by a designated representative of the head of the submitting DOD component and are addressed to the ASD (Comptroller), who reviews the document, obtains any coordination necessary, takes appropriate action for the Secretary of Defense, and transmits it to the implementing component.

CHAPTER V

IN SEARCH OF FLEXIBILITY

Factors reflected in the PCP process which inhibit flexibility of management on the part of the individual military service and department manager are the same ones which allow flexibility on the part of the Secretary of Defense. It is our premise that the balance has been swung far to the side of the Secretary as he has become increasingly enraptured with centralizing decision making and management under his personal control.

Review

In Chapter I, we pointed to the Program Change Proposal as reflecting the management techniques and requirements which contribute to system rigidity. In addition, we examined the pre-McNamara budgeting process, the newly implemented planning-programming-budgeting system, and ended with a retrospective view of system performance. Our attention was directed in Chapter II toward the level of threshold establishment and the stringency of controls and reporting requirements as being, to some extent, indicative of the degree to which management authority is centralized. We also discussed the "human problem" associated with loss of the exercise of prerogatives and authority by lower level managers. Our aim in Chapter III was to examine systems analysis as a decision-making tool of top defense management. We

discussed problems and limitations of the methodology as well as contrasting the Secretary's total system approach to decision making with the sub-system oriented considerations by which the lower level manager is apt to assess the results of the same analysis.

In Chapter IV we reviewed the current planning-programming-budgeting process and current Program Change Proposal procedures, including established thresholds, as shown in the Figure on page 38.

The Stringent Bonds of Conformity

Our purpose now is to examine this process in the light of previous discussions and criticisms, as well as other available evidence, with the ultimate aim of suggesting changes to the present process which will not only serve the Secretary's needs, but which will better serve the needs of service managers in terms of flexibility of management within their own departments, and improved quality and responsivness of service inputs to defense decision making.

We have seen that the Secretary's control over the defense establishment has been facilitated through the Program Change Proposal device. PCP's are required to be submitted whenever an established threshold is broken or whenever the Secretary announces a decision affecting the approved FYFS&FP, either directly or indirectly (such as in the case of authorization of a new program or element thereof). Not only is the Secretary in a position to manage the Defense Department by directing his attention toward the "exceptions" to

the approved defense program, but he insures compliance with his decisions by requiring that the Format B bearing his decision must be signed and returned by the head of the implementing DOD component. Should the head of this DOD component wish to reclama the Secretary's decision, he must, within ten working days, gather, formulate, and submit all new, previously unconsidered data in support of the reclama. Thus, we see that all decisions of the Secretary are final, at least with respect to supporting data available at the time of the decision. Unless the military manager can gather additional data to support his professional judgment on the subject matter of the PCP within ten working days, this valuable judgment goes unheeded (perhaps this short reclama period is a device reflecting a desire of the Secretary to keep lower level agencies from constantly reopening issues, as was discussed in Chapter II).

Thresholds and Centralized Authority

Thresholds, as established by the Secretary of Defense, serve to facilitate "management by exception" on his part. The lower these thresholds are established, the more "all-knowing" is the Secretary and the more he gathers decision making to his own hierarchical position. It is readily apparent to us that the lower these thresholds are established, the less the service manager has to say about how he runs his service, the greater is the demand for compliance alone in the performance of his duties, and the more substantiating reports of compliance and other feedback information that must

be funneled upward to support this diminished authority. In this light, it is interesting to note that one high-ranking service manager recently confided that his service alone had submitted over 5 million pages of documentation in the last year in support of PCP submissions, studies, and feedback reports to the Office of the Secretary of Defense.[1]

Thresholds, as reflected in published PCP procedures are low. For example, one can note from the Figure on page 38 that any change in DOD component TOA, manpower, forces, or new program elements penetrates the established thresholds and therefore requires formal PCP submission and the Secretary's approval. Other thresholds established for research and development, investment, and operating costs are similarly low in relation to total dollar expenditures. Since the Secretary of Defense has reserved for himself approval authority over all threshold penetrations, we can say that authority is centralized in the hands of the Secretary of Defense.

The reader will recall our contention in Chapter II that the degree of system flexibility varies directly with the level at which subordinate's authority thresholds are established and inversely with the stringency of performance standards and reporting requirements (e.g., the requirement that full and detailed costs accompany initial PCP submission). We have since established that present thresholds are low and that authority is highly centralized in the hands of the Secretary. In these respects, we find that the system

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[1]Name and service withheld due to sensitivity of individual's position.

described above is parallel in structure, threshold-wise, to the theoretical OSR assessed by McKean and Anshen, in terms of problems, risks, and limitations of program budgeting.[2]

We believe that present thresholds are too low and that, as a result, the value of the management-by-exception principle is lost to the Secretary of Defense because nearly all program changes are exceptions to the established thresholds. Furthermore, there is no procedure by which PCP's can be ordered in terms of importance or sensitivity to the decision at hand, since present thresholds do not differentiate categorically between the size or importance of individual issues, and all require the same extensive cost data submission.

We contend that management should be decentralized, giving military service and department managers authority commensurate with their responsibilities, and that elevated thresholds, resulting from decentralized authority, should also be modified to differentiate between issues in relation to their relative importance. That this contention is feasible is supported by McKean and Anshen.[3] These writers, while noting that program budgeting may be "conducive to centralization of authority," point out that there is "no inherent necessity for such a relationship."[4] Further, they assert that "program

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[2] McKean and Anshen, op. cit., p. 225.

[3] Ibid., p. 232.

[4] Ibid.

budgeting and the accompanying control devices should be designed to accommodate . . . different situations. It should not be a procrustean bed that forces all decisions and activities to adjust to a single procedure and a single degree of central control."[5]

It would seem that findings of McKinsey and Company, as expressed in their preliminary study of the DOD management planning process, would also tend to support our argument. Their review of nearly 500 PCP's indicated no correlation between the size or importance of the decision and the amount of detailed documentation generated. In addition, they looked with disfavor upon the requirement that the Secretary must approve every individual PCP that breaks current thresholds, regardless of its significance. Their report states:

> We believe important issues cannot be defined in quantitative terms alone; therefore, an across-the-board threshold is inadequate for identifying those issues that should receive full OSD attention. At best, this lack of discrimination appears to waste the time of both proposal preparers and reviewers; at worst, it prevents devoting adequate time to the key decisions.[6]

Thus, McKinsey and Company and McKean and Anshen have opened the door for our arguments. Defense authority should be decentralized and thresholds should be raised. In addition, individual thresholds should be established to fit the particular force, manpower, program element, or

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[5] Ibid.

[6] McKinsey and Company, Inc. (Management Consultants), Preliminary Study of the Defense Department Management Planning Process, Memorandum to the Assistant Secretary of Defense (Comptroller) dated January 5, 1966, p. 3.

item in relation to its importance and the magnitude of its effect on the major program of which it is a part.

Decision and the Value Judgment

The Secretary's decisions, as handed down to the DOD components, reflect his value judgments as they come to bear on the particular decision. These value judgments are not always in consonance with what the service manager might consider prudent management judgments. As Baldwin points out, for instance, the F-111 (TFX) contract "went . . . to General Dynamics . . . although the services, in three separate evaluations, preferred the Boeing proposal."[7]

The point here is that for all the professional military judgment, experience, efforts, resource expenditures, and time that go into such service evaluations or studies, the final decision, even when cost-effectiveness analyses are used, is simply a reflection of the Secretary's own particular convictions and value judgments, as modified by political and economic considerations. Daniel Seligman reaches this same conclusion. He observes:

> McNamara's value judgments, expressed in the relationships he finds between costs and effectiveness, probably should be questioned much more closely than they have been. Is he making the kind of "leaps" from the data that we want?[8]

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[7] Baldwin, op. cit., p. 269.

[8] Seligman, op. cit., p. 248.

Practice Makes Perfect?

In addition to the Secretary's value judgments, we feel that the cost-effectiveness analyses, too, upon which these value judgments are supposedly based, should be looked at much more closely. We wonder if the vast streams of data required to support PCP submissions are truly necessary and beneficial, or simply a device to keep the Office of Systems Analysis alive? Hitch, reflecting on cost-effectiveness studies, states:

> Where the information generated is not visibly used in the actual decision-making process, the capability to perform such analyses will wither. So the programing system has been designed to ensure through the program change procedures that the fruits of cost-effectiveness studies in the form of proposals for program changes will receive timely and complete review.[9]

McKinsey and Company report findings that we believe result directly from this process designed to feed the cost-effectiveness appetite of DOD:

> 1. The present system is burdened with unnecessary detail. For example, PCP's must contain sufficient detail to update the FYFS&FP, substantially more detail than is typically needed for decision making. Nor are these data specifically geared to the decision to be made. Moreover, because nearly 50 percent of the PCP's submitted are rejected or substantially modified, the requirement that PCP's accompany the original proposal results in much wasted work.
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> 2. That the system does not effectively support decision making is borne out by the fact that, while dedicated to the system, DOD personnel for practical purposes have bypassed it in many instances. For example, PCP's are in fact rarely used as the document to resolve major issues. These decisions are now largely made in conjunction with draft Presidential Memorandums, Secretary of Defense memorandums, etc.

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[9] Hitch, Decision Making for Defense, p. 64.

> 3. Both program change proposers and reviewers tend to hold up PCP's until the calendar deadline (or beyond), even though they could have been submitted earlier. This "batching" by the services reflects a need to aggregate related issues, as well as the desire to use the latest possible information in PCP submissions . . . the tendency to hold up PCP's contributes to the fact that roughly 30 percent of these proposals are "folded in" to the budget process, thereby defeating a key objective of the system, namely, to make defense decisions in longer range, program terms.[10]

It is our contention that the complexity built into the PCP system to support cost-effectiveness analyses is the same complexity that burdens the system with unnecessary detail and that efforts to avoid this unnecessary detail result in bypassing the system as well as "batching" the PCP's for deadline submission. This complexity is traceable again to centralized authority under top defense management. Hitch, for instance, in initially viewing the new programming system, reported, " . . . we have provided the necessary flexibility in the form of a program change control system."[11] That this assumption of system flexibility gave way, rather, to system complexity is borne out by Novick's observation:

> It was originally thought that only summary-type data would be required in the initial submission of a change proposal. However, Mr. McNamara's requirement has been for rather full justification of the proposal and as complete detail (forces, costs, manpower, procurement schedules, financing, etc.) as is appropriate to the evaluation.[12]

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[10] McKinsey and Company, Inc., op. cit., p. 3-4.

[11] Hitch, Decision Making for Defense, p. 39.

[12] Novick, op. cit., p. 67.

It would seem, from the numerous shortcomings discussed, that perhaps the defense management process itself would benefit from a thorough and rigorous cost-benefit analysis, with heavy emphasis on the cost part of the formula.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The reader will recall our research question, "Can the Program Change Proposal System be modified in such a way as to improve programming flexibility and responsiveness to change?" Our prefatory remarks recognized present centralization of authority in the Office of the Secretary of Defense as a "key" causal factor promoting system rigidity. Threshold levels and detailed costing requirements were recognized as being the "handles" by which we would grasp the problem.

Our findings have supported the contention that thresholds, as currently established, lend themselves to system rigidity in that service level managers lack the bargaining power and influence necessary to promote innovative efforts and keep them "looking for business." Our prefatory thoughts concerning detailed costing requirements have, however, proved somewhat "off target" and our findings have led instead to cost-effectiveness analyses as supported by the detailed costing requirements, as lending rigidity to the system. The results of our study indicate that the Program Change Propocal <u>can</u> be modified in such a way as to improve system flexibility and responsiveness to change.

Thresholds

Present thresholds, as previously discussed, are not only low but possess the undesirable features of applying the same low categorical ceilings and requiring the same vast amount of burdensome documentation in support of all PCP's regardless of their importance to the decision at hand. This, coupled with the Defense Secretary's requirement that he must approve all program changes, gives us some indication of the amount of superfluous effort generated by OSD.

As we discussed in Chapter II, problems such as this do not lend themselves to isolated examination, nor to optimal solutions. Rather, recommendation of a more favorable range of activity or degree of compliance is the logical solution. Our recommendations concerning thresholds are:

1. Thresholds should be raised. They should be raised enough to provide service level managers with the decision-making authority at their own level, and the bargaining power at OSD level that would provide the incentive for this manager to seek continually better alternatives and to give him the opportunity to "sell" his product to OSD. While we cannot quantify the degree to which thresholds should be raised, if it is achieved, it will be evidenced by service salesmen standing at the Secretary's door.

2. Percentage thresholds should be established. The present "across-the-board" thresholds are, as previously discussed, unsatisfactory. Our solution would be to apply "percentage" thresholds to particular categories

or issues, with particularly sensitive issues being identified and marked by a smaller percentage. This would allow issues to be categorized (a) in a relationship to the relative cost of the issue as compared with others in its category (e. g., by size) and (b) with respect to established and identified relative sensitivity in relation to other issues. This, we believe, would shrink the Secretary's daily menu of undifferentiated PCP's, thus allowing his efforts to be concentrated on the really important issues. In addition, it would give the service manager much needed flexibility in that he would be free of the shortcomings of the across-the-board thresholds and would be able to devote his time and efforts to particular issues insome relationship to their importance or sensitivity.

3. Full data submission should accompany only those PCP's for which such data are known to influence the final decision. Present unnecessary detail which we have determined burdens the PCP system can be alleviated somewhat through early identification of sensitive issues in conjunction with the establishment of the percentage thresholds recommended in paragraph 2 above. Our recommendation is that full documentation and justification should be reserved for only those relatively few change proposals involving high sensitivity issues, in which it has been ascertained that such data submission will, in fact, be required in shaping the decision.

Cost-Effectiveness Analysis

While our early discussions of systems analysis (of which cost-effectiveness analyses are a part) brought out certain limitations of the methodology, we can see that the process does have much merit and can, in some circumstances, be of particular usefulness to the decision maker. In our later discussions, however, we came to wonder whether a great deal of the required data submission which burdens the PCP system is not merely for analytical practice. In this light, our closing remark to the last chapter was not made in jest. Our recommendations are:

1. A thorough cost-benefit analysis of the present PCP process is in order. Such an analysis should be undertaken as a step toward highlighting the costs to DOD components of supporting the present requirement for full and detailed data submission to accompany each PCP. Such costs could be summarized, in dollar terms, by such categories as manhours, electronic and telephonic transmissions, reams of paper, copying machines, computer systems, back-up files, supporting civilian analysts, and other support requirements. Many necessary processes have suddenly seemed "not so necessary" when their dollar costs are thus exposed.

2. Systems analysis should be developed as a departmental and service "in-house" capability. This "in-house" capability would insure that the objectives of such analyses, along with the alternatives, assumptions, and criteria would be developed in the light of experienced military judgment. The usefulness of this capability at military service and department level

would bear a relationship to the extent to which thresholds are raised in accordance with our previous recommendation, thus relaxing decision-making authority at service level. With this recommendation comes the proposal that service decisions could be made the subject of after-the-fact review by OSD in those cases where it is felt that such analyses would substantially aid in making the decision. Service managers would benefit from increased flexibility in their exercise of authority and decision making, while the Secretary and his systems analysts could concentrate almost entirely on key defense decisions and problems that cross traditional service boundaries.

3. The PCP system should be retained, not abandoned, and should be modified toward greater flexibility and responsiveness. While much current thought centers on doing away with the PCP, it is our belief that "a change proposal by any other name is still a change proposal," and that such a process is necessary to the programming system. We would confine the PCP to threshold related submissions. We would delete the requirement that full costing and justification accompany PCP submission, and we would concentrate on submission of summary data to support variance analysis only. Threshold sensitivity, in this respect, should be established so that reprogramming requirements as set forth by the Congress are the determining criteria. Congress would most likely revise these reprogramming criteria upward as the Secretary of Defense demonstrated a thoroughgoing and workable system in support of variance analysis, as their purpose is to assure that funds duly appropriated are wisely spent. PCP's oriented toward

variance analysis would permit the Secretary of Defense to assess management performance at lower levels as well as to isolate and identify causal factors. Cost-effectiveness analysis, assuming the in-house systems analysis capability recommended in paragraph 2 above, could enter the programming process in connection with service inputs to the JSOP. The Secretary, in conjunction with his systems analysis staff, would combine an after-the-fact review of cost-effectiveness inputs to the JSOP with the scheduled annual JSOP review. The only documentation required, then, in order to effect a change, would be transmission of the decision to the DOD components for the purpose of updating the approved FYFS&FP.

Conclusions

In conclusion, our only reservations with respect to the foregoing recommendations are concerned with the motives of the Secretary of Defense himself. We wonder if, perhaps, the burdens of centralized authority and decision making, along with a detailed and costly change proposal process, are not deliberarely calculated prices that the Secretary would charge in order to keep decisions from constantly being reopened, to prevent lines of military service and department salesmen from forming at his door, and, above all, to assert his full authority over those who have thought to close their eyes in the hope that McNamarism would go away.

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